

SCALE: 1/4" = 1'-0

## ENVIRONMENTAL REQUIREMENTS

) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F N THE CONTROL & EQUIPMENT ROOMS 65°F-71°F IN EXAM ROOM. RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK. ) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. T IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-

AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.

50% FRESH AIR INTAKE.

) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie. UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR. 5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST. 6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING. IT S RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

#### CHILLED WATER SYSTEM BYPASS WITH FULL SIZE PIPING TO INCLUDE 3/4" MINIMUM BOILER DRAIN AND MINIMUM 3/4" BYPASS PIPE WITH BALL VALVE SHUT-OFF VALVES INSTALLED AND 3/4" BOILER DRAIN WITH CAP. WITHIN 18" OF IFP, AUTOMATIC AIR BLEEDS WITH BALL VALVES -INSTALLED AT THE HIGHEST POINT OF THE SUPPLY AND RETURN LINES. PLUMBING PIPE . 16 FOOT MAX. HOSE LENGTH SIEMENS PROVIDES 1-1/4" MALE NPT AT IFP 82 FOOT MAX. ONE WAY PIPE LENGTH FOR 2" DIAMETER PIPE. 148 FOOT MAX. ONE WAY MAXIMUM PIPE LENGTH FOR 2 1/2" DIAMETER PIPE. HOSE LENGTH \_\_ \_\_ A MAXIMUM OF 25 LONG RADIUS ELBOWS ARE ALLOWED FOR TOTAL RUN. -BOILER DRAIN INSTALLED AT CHILLER BY MECHANICAL SIEMENS SUPPLIED KKT KRAUS ECO CHILLER CAN BE INSTALLED MAXIMUM 32 FEET ABOVE MR SYSTEM. CAN BE INSTALLED MAXIMUM 82 FEET BELOW MR SYSTEM. COMPRESSOR AND INSTALLED CABINETS THE MECHANICAL ENGINEER OF RECORD SHALL BE ULTIMATELY RESPONSIBLE FOR THE SITE SPECIFIC DESIGN AND SPECIFICATION OF ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED, THE MECHANICAL AND PIPING SYSTEMS AS SHOWN AND SHALL BE IN INSTALLED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES. ALL WORK SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE CONTRACTOR AND SHALL BE SUBJECT TO COMPLIANCE WITH ALL SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED APPLICABLE LOCAL, STATE AND NATIONAL CODES. AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY TO THE FP MUST BE LABELED TO SHOW FLOW DIRECTION AND KRAUS CHILLER AN AUTOMATIC DEAERATION DEVICE (AIR VENT) WITH BALL VALVE MUST BE INSTALLED BY THE MECHANICAL CONTENT (WATER/GLYCOL). A TAP WATER SUPPLY MUST BE AVAILABE WITHIN 45' OF THE SYSTEM MUST BE PROVEN TO BE FREE FROM LEAKAGE. IFP AND CHILLER CONNECTION FOR FILLING THE CIRCUIT. PIPING SCHEMATIC FOR CHILLED WATER-KRAUS ECO CHILLER SCALE:

# CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A DEDICATED KRAUS ECO CHILLER AND INTERFACE PANEL. CHILLED WATER CAN ALTERNATIVELY BE SUPPLIED BY OTHER MEANS IN COMBINATION WITH A SEPARATOR CABINET PROVIDED BY SIEMENS. THE PIPE SIZE BETWEEN THE KRAUS CHILLER AND INTERFACE PANEL. OR BETWEEN THE WATER SUPPLY AND SEP MUST BE 2 INCH UP TO 82 FEET, 2-1/2 INCH UP TO 148 FEET, CONSULT KKT KRAUS FOR LONGER PIPE. PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES. THESE REQUIREMENTS ARE REQUIRED FOR NEW INSTALLATIONS, IF EXISTING WATER PIPES COMPLY WITH SIEMENS WATER SPECIFICATIONS, THEY DO NOT NEED TO BE REPLACED. NORMAL TAP WATER MUST BE AVAILABLE FOR FILLING THE SECONDARY

WATER CIRCUIT. THERE SHALL BE A HOSE BIB LOCATED WITHIN 65' OF THE SEP, EPC OR THE KRAUS CHILLER. THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

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### MECHANICAL NOTES

1) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT. 2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE DÉLIVERY OF THE EQUIPMENT.

3) SIEMENS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

4) SIEMENS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS O INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HÉLIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

#### FIRE CONTROL NOTES

) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION. FIRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN. THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL. 2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED. SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS, SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC.

SERVICE AGREEMENT.

PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR

4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVE GUIDE TO BE EQUIPPED WITH A SIEMENS APPROVED DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVE GUIDE. ALL WAVE GUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD.

5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE THROUGH AN RF FILTER TO BE SUPPLIED BY THE RF SHIELD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD.

6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD. 7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE

FIRE PROTECTION SYSTEM. 8) THE USE OF HALON IS NOT ACCEPTABLE.

THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN.

10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

REV 0

COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

CEILING HEIGHTS

MAGNET EXAMINATION ROOM: 7-11" MINIMUM EQUIPMENT ROOM: 7'-3" MINIMUM WITH RESTRICTION

ALL ANCILLARY AREAS: 6'-11" MINIMUM

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.	
- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED	
EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION	
PHYSICIST TO SPECIFY RADIATION PROTECTION.	

Drawing Title

Approved: Project Director

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			PROJECT MANAGER TEL: (317) 341 VMAIL: FAX: EMAIL: trent.childre	EXT:	5		SIEME	NS	
			3200 VINE STREET, CINCINNATI, OH 45220 MRI SUITE 2024 - MAGNETOM SKYRA W/MOBILE TABLE						
$\triangle$	11/03/15	CHANGED ISO CENTER LOCATION PER CUSTOMER	THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT		PROJECT #:		SHEET:		
$\triangle$	10/22/15	R101R(B) DATED 09/29/15 APPROVED BY CUSTOMER FOR FINALS	RESULT IN PROS	ORIZATION WILL SECUTION UNDER OF THE LAW.	1400	8880	⅃ <i>ℕ</i> ႔ 1∩⁴		
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	-ISSU	E BLOCK-	SCALE: AS NOTED	REF. #: 30182993	DATE: 11/03/15				
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**ATTENTION:** 

**CONSULTANTS:** 

Date

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED

AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN

- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.



(513) 861 3200



**VENDOR EQUIPMENT (FOR** REFERENCE ONLY)

CHILLED WATER REQUIREMENTS

FOR INSTALLATION OF A KKT CHILLER, IT IS THE RESPONSIBILITY OF THE

CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER

THE AMOUNT OF THE MIXTURE MUST FILL THE CHILLER, MR SYSTEM AND

(1) GALLON OF UNDILUTED GLYCOL, OR (2) GALLONS OF WATER/GLYCOL

MIXTURE VOLUME INCLUDING SUPPLY & RETURN+15 GAL. CHILLER & MR

PIPE DIAMETER TOTAL LENGTH MIXTURE VOLUME GLYCOL NEEDED

MIXTURE VOLUME = 3.14 x (PIPE RADIUS)2 x PIPE LENGTH + 15 GALLONS

47.6 GALLONS

40.5 GALLONS 15.4 GALLONS

66.0 GALLONS 25.1 GALLONS

WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP.

DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE.

MIXTURE MUST REMAIN ON SITE FOR USE AFTER START UP.

PIPING (SUPPLY AND RETURN), SEE EXAMPLES BELOW.

200'

GLYCOL AMOUNT = 35-38% OF MIXTURE VOLUME.

WATER TEMPERATURE:

WATER PRESSURE

PRESSURE LOSS

2.5"

HEAT DISSIPATION TO WATER

CHILLED WATER ACIDITY RANGE

CHLORINE GAS CONCENTRATION

CHILLED WATER HARDNESS

31.7 GPM

66.2°F - 71.6°F

204,910 BTU/HR

MAXIMUM 87 PSI

6 pH TO 8 pH

<250 ppm CALCIUM CARBONATE

<200 ppm

700 µm

roject Title **Building 01-Imaging Center** 

VA Project No. 539-CSI-201 PFB Project No. 3585.00 01- Imaging Center Drawing Number

Office of Construction and Facilities Management Department o Veterans Affa

Dayton OH 45409 (937) 224 0861

Cincinnati, Ohio PFB PFB 10/30/2015

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